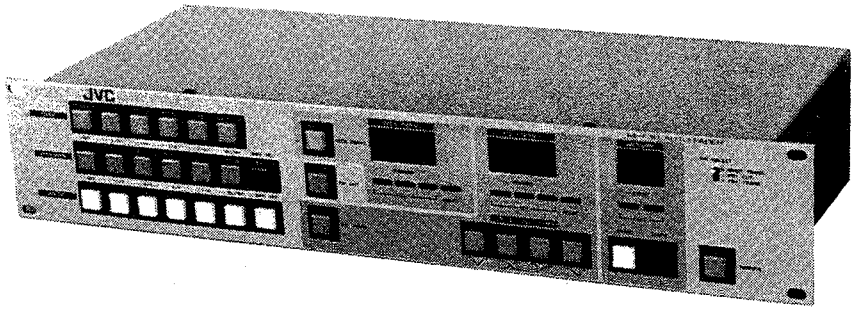
JVC

SERVICE MANUAL

AUTO FADER

MI-F30



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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

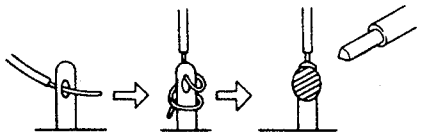


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

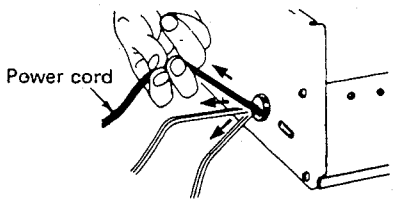


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

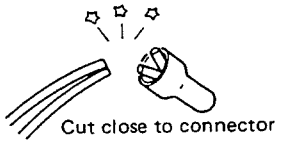


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

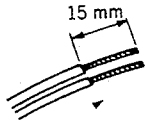


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

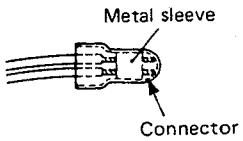


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

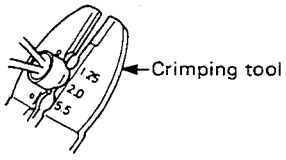


Fig. 6

(5) Check the four points noted in Fig. 7.

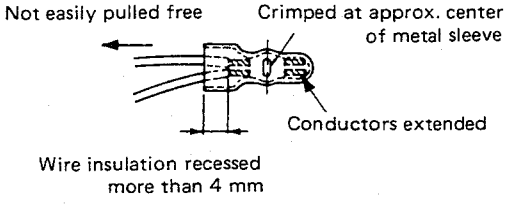

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

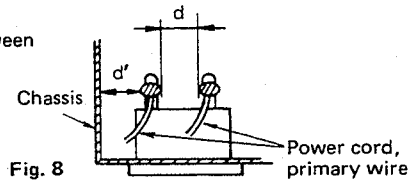


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

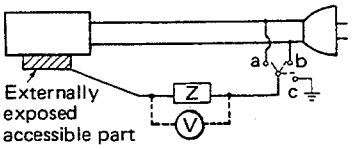


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

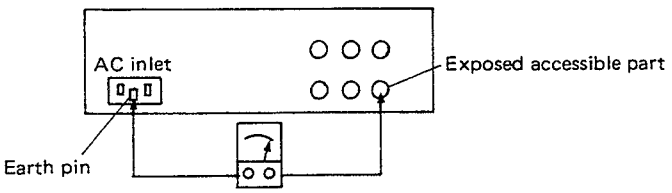


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 1
DISASSEMBLY

1.1 REPLACEMENT OF FUSE

Before replacing the blown fuse, examine the reason why it blew first and, if there is something wrong, repair it to prevent the unit from further trouble.

1. Disconnect the power cord from the AC outlet and turn off the power switch.
2. Remove six screws ① to take off the top cover.

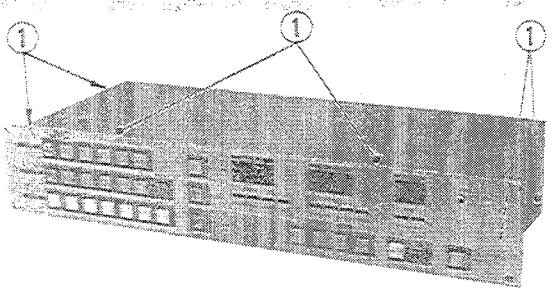


Fig. 1-1

3. Fuse is located on the CPU board.
   For safety and protection of the unit, use a fuse of the specified part number*.

* For the part number of F1, refer to the parts list of the MI-F30 assembly.

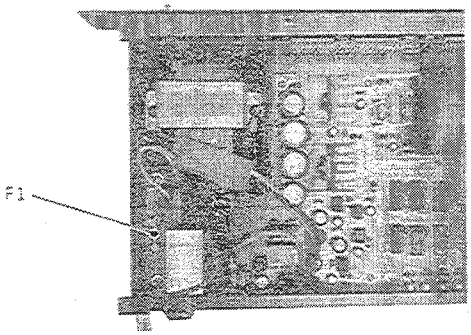


Fig. 1-2

1.2 REMOVAL OF FRONT PANEL

- Perform the following procedure as the top cover is removed.

1. Remove three screws ②.
2. Disconnect the flat cable connector from CN14 of the CPU board.

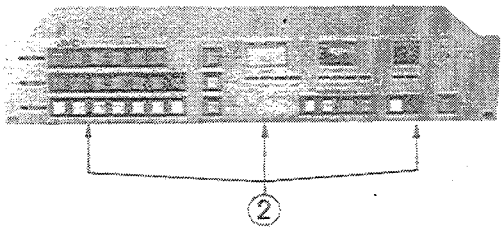


Fig. 1-3

1.3 REMOVAL OF CIRCUIT BOARDS

1.3.1 CPU board

1. Remove ten screws ③ (indicated by arrow marks).
2. Disconnect the connectors from the three points Ⓐ, Ⓑ and Ⓒ.

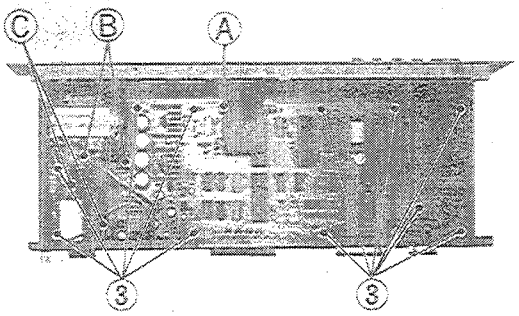


Fig. 1-4

1.3.2 SW (switch) board and LED board

- Proceed to do the following steps with the top cover removed.

1. Remove seven screws ④ to remove the SW board together with the LED board.
2. The LED board can be removed from the SW board by disengaging the socket which connects the two.

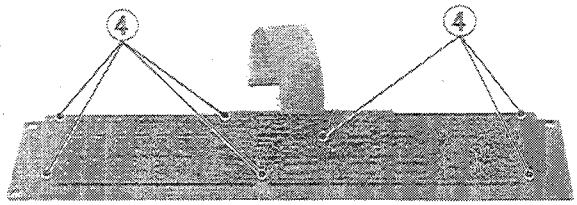


Fig. 1-5

1.3.3 Power transformer

1. Remove two screws ⑤.
2. Remove a screw ⑥ securing the grounding wire (green).
3. Disconnect two connections of the connectors Ⓓ.

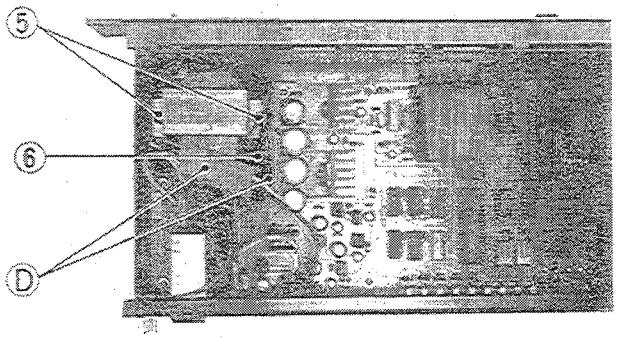


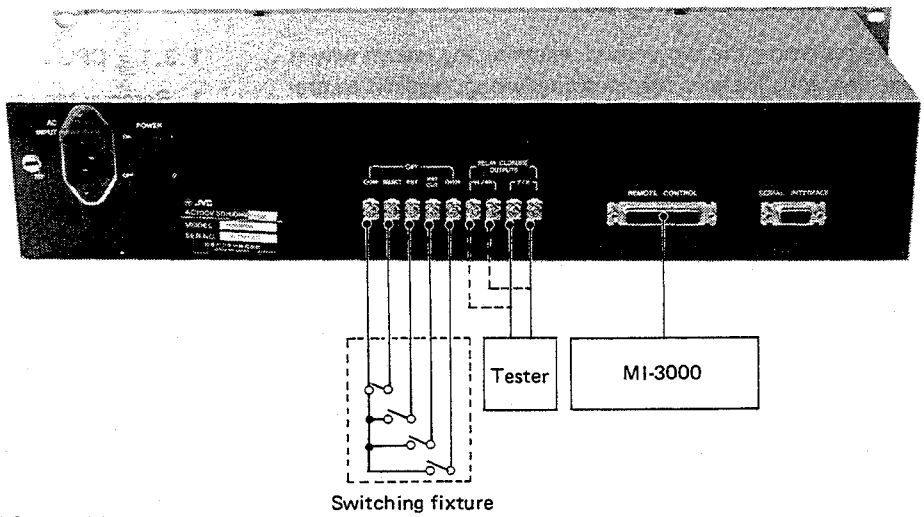
Fig. 1-6

SECTION 2
CHECKUP OF OPERATIONS

2.1 NECESSARY EQUIPMENT

1. MI-3000 (Audio Mixer)
2. Tester
3. Switching fixture

2.2 CONNECTIONS



2.3 SETTING OF SWITCHES AND CONTROLS

Unless otherwise specified, set switches and controls as shown in the table below.

	Switches/Controls	Position	Remarks
CPU board	DIP SW S201	1, 5, 6 : ON	SYS ADRS "30H"] Self test mode
	S202	2, 6, 8 : ON	PARITY ODD, EDITOR MODE] Self test mode
	S203	2 : ON	BAURATE 9.6 KB PS
	S501	5, 6, 7, 8 : ON	RS-232C (with RCV)
Front Panel	OVER SW	OFF	] Cross point
	PROGRAM SW	OFF	] Cross point
	PRESET SW	OFF	] Cross point
	CROSS FADE RAMP	⨉ ON	CROSS FADE
	OVER TRANS. Display	0	] Transition rate
	PST TRANS. Display	0	] Transition rate
	MEMORY Display	0	Memory No.
	REMOTE SW	ON	Lamp is lighting.
	• **Settings on MI-3000**		
	FADER	MAX	
	PGM SW	OFF	
	RETURN SW	OFF	
	PFL SW	OFF	
	MONITOR SOURCE SW	MASTER	
	OSC SW	OFF	
	TALK BACK SW	OFF	

2.4 CHECKUP OF OPERATIONS

1. SELF-TEST (Automatic)
   By switching the DIP switches on the CPU board, set the unit to the self-test mode.
   1) To check up 7-segment display : OVER TRANS. — 000 → 999 - - - - - - - - → 111
   2) " : PST TRANS. — 000 → 999 - - - - - - - - → 111
   3) " : MEMORY — 00 → 99 - - - - - - - - - → 11
   4) To check up lamps : OVER CROSS POINT (OFF - - - - - → 9L/9R) → OVER TRANS.
   5) " : PROGRAM CROSS POINT (OFF - - - - - → TAPE RET) → PST CUT
   6) " : PRESET CROSS POINT (OFF - - - - - → TAPE RET) → PST TRANS.
   7) " : CROSS FADE RAMP (⌐V¬ - - - - - → ¬V⌐) → READ → STORE → REMOT
   8) To check up channel selector and VCA control
      a) A PGM LED of the input module of the MI-3000 (Auto Mixer) lights correpondingly to the selected channel whose indicator LED is lighting on the MI-F30.
      b) Sound volume varies in accordance with the MI-F30's operation.

9) Checkup of RELAY CLOSURE OUTPUTS
When the OVER 7/8 or 9L/9R LEDs brighten, terminals on the rear panel corresponding to the brightening LEDs are in short-circuit.

2. Checkup of KEY INPUT (Manual)
1) Press the FRAMES SET key of the OVER TRANSLATE switch so that the 7-segment display reads "111".
2) Press the FRAMES SET key of the PST TRANSLATE switch so that the 7-segment display reads "111".
3) Press the EVENT SET key of the MEMORY switch to show "11" on the 7-segment display.
4) Press the RESET key of the OVER TRANSLATE switch to set the 7-segment display to "000".
5) Press the RESET key of the PST TRANSLATE switch to set the 7-segment display to "000".
6) Press the READ key and confirm the LED lighting.
7) Press the STORE key and confirm the LED lighting.
8) Press the REMOTE key two times to confirm that the LED once goes out and then lights again.
9) Press the CROSS FADE RAMP keys in the order of " ", " ", " ", " " to check up that the lamp corresponding to the pressed key comes on.
10) Set the 7-segment display for the OVER TRANSLATE to "010".
11) Set the 7-segment display for the PST TRANSLATE to "010".
12) Press the OVER CROSS POINT keys (OFF – 9L/9R) one after another and confirm that the lamp corresponding to the pressed key comes on.
13) Press PGM CROSS POINT keys (OFF – TAPE RET) one after another and confirm that the lamp corresponding to the pressed key comes on.
14) Perform the same checkup for the PST CROSS POINT keys (OFF – TAPE RET) as in the above step.
15) Press the OVER TRANS key to check up that the lamp is turned on.
16) Press the PST TRANS key for the same purpose as done in the above step.
17) Press the PST CUT key to do the same checkup as the above step 15).

3. Checkup of GPI INPUTS
1) Shortcircuit the OVER TRANS and COMMON of GPI input terminals, and confirm that the lamp of the OVER TRANS key lights.
2) Check up lighting of the PST TRANS key's lamp by making a shortcircuit between the PST TRANS and COMMON of GPI input terminals.
3) Shortcircuit the PST CUT and COMMON of GPI input terminals to check up lighting of the PST CUT key's lamp.
4) Set the GPI SELECT switch on the front panel to "OVER TRANS" position and shortcircuit the SELECT and COMMON of GIP input terminals to confirm that the lamp of the OVER TRANS key lights.
5) Set the GPI SELECT switch on the front panel to "PST CUT" position and shortcircuit the SELECT and COMMON of GPI input terminals to check up that the lamp of the PST CUT key comes on.
6) Set the GIP SELECT switch on the front panel to "PST TRANS" position and shortcircuit the SELECT and COMMON of GIP input terminals to confirm that the lamp of the PST TRANS key is turned on.

4. Checkup of DIP switches
1) Turns off the power.
2) Set DIP switches as follows: S201 ① to ON, S202 ⑥ to ON, and S203 ① – ④ to OFF.
3) Turns on the power and turns off all switches of S201 and S202 two seconds or more later to confirm that all 7-segment displays read "0" at that time.
4) Turn on S201 ① and confirm that a number of the first figure of the OVER TRANSLATE display becomes "1". The displayed number returns to "0" by turning off S201 ①.
In the same manner as above, perform the checkup for S201 ② to ⑧, and confirm that the displayed number changes from 2 to 8 in accordance with the switch number of the DIP switch.
5) Turn on S202 ① and confirm that a number of the first figure of the PST TRANSLATE display becomes "1". Turning on S201 ① returns the number to "0".
In the same manner as above, perform the checkup for S202 ② to ⑧, and confirm that the displayed number changes from 2 to 8 in accordance with the number of the DIP switch.
6) By turning S203's DIP switches to ON, perform the same checkup as done in the above steps for the number of the first figure of the MEMORY display. And, perform it for 2 to 4 by turning on S203's ② to ④ switches, too.
7) After completion of the above checkup, make sure to turn off all switches of S201, S202, S203 and the power.

2.5 SETTING OF DIP SWITCHES

1. S201 – SYSTEM ADDRESS

DIP switches	Mode	At Self-Test	At Shipment
S201 - 8	SYSTEM ADRS bit 7 (MSB)	OFF	OFF
S201 - 7	SYSTEM ADRS bit 6 (MSB)	OFF	OFF
S201 - 6	SYSTEM ADRS bit 5 (MSB)	ON	ON
S201 - 5	SYSTEM ADRS bit 4 (MSB)	ON	ON
S201 - 4	SYSTEM ADRS bit 3 (MSB)	OFF	OFF
S201 - 3	SYSTEM ADRS bit 2 (MSB)	OFF	OFF
S201 - 2	SYSTEM ADRS bit 1 (MSB)	OFF	OFF
S201 - 1	SERVICE	ON	OFF

2. S202 – MODE & Others

DIP switches	Signal	ON	OFF	At Self-Test	At Shipment
S202 - 8	MODE	EDITOR MODE	AFV MODE	ON	OFF
S202 - 7	EFFECT ADRS	0 5 ONLY	ANY EFF ADRS	OFF	OFF
S202 - 6	SERVICE		OFF	ON	OFF
S202 - 5	RELAY CLOSURE OUTPUT	MONENTARY	CONTINUOUS	OFF	OFF
S202 - 4	FRAME	PAL	NTSC	OFF	OFF
S202 - 3	MANUAL	DISABLE	ENABLE	OFF	OFF
S202 - 2	PARITY	ENABLE	DISABLE	ON	OFF
S202 - 1	PARITY	EVEN	ODD	OFF	OFF

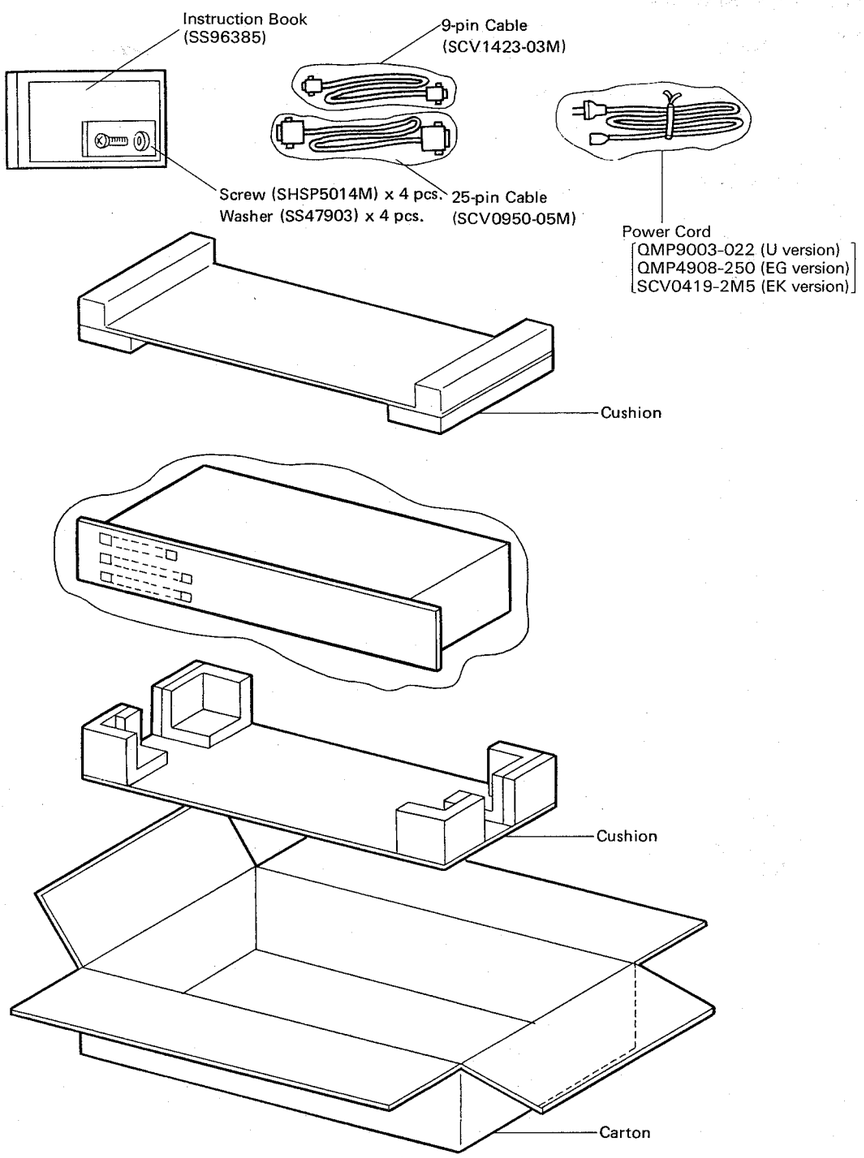
3. S203 – BAUD RATE (only one set to "ON")

DIP switches	BAUD RATE	At Self-Test	At Shipment
S203 - 4	BAUD RATE 38.4 K BPS	OFF	ON
S203 - 3	BAUD RATE 19.2 K BPS	OFF	OFF
S203 - 2	BAUD RATE 9.6 K BPS	ON	OFF
S203 - 1	BAUD RATE 4.8 K BPS	OFF	OFF

4. S501 – SERIAL INTERFACE MODE

DIP switches	RS-422	RS-422 RCV ONLY	RS-232C RCV ONLY	RS-232C	At Self-Test	At Shipment
S501 - 8	OFF	OFF	ON	ON	ON	OFF
S501 - 7	OFF	OFF	ON	ON	ON	OFF
S501 - 6	OFF	OFF	ON	ON	ON	OFF
S501 - 5	OFF	OFF	OFF	ON	ON	OFF
S501 - 4	ON	OFF	OFF	OFF	OFF	ON
S501 - 3	ON	OFF	OFF	OFF	OFF	ON
S501 - 2	ON	ON	OFF	OFF	OFF	ON
S501 - 1	ON	ON	OFF	OFF	OFF	ON

SECTION 3
REPACKING



SECTION 4
EXPLODED VIEW AND PARTS LIST

4.1 SCREWS AND WASHERS CODING

Note: In this exploded views the part number of the screws and washers designate the type and dimensions* of those items.
The following examples will help you to decipher them.

Type of screw — 1. 2. 3. 4. — Diameter 5. 6. — Length in mm 7. 8. — ISO screw 9. 10.
(3. 4. See. 1-1; 5. 6. See. 1-2; 7. 8. Material; 2. Shape of head; 1. Type of screw; 9. Surface treatment)

Type of screw

S	Normal screw
N	Assembly screw
L	"
D	"
G	"
M	W. Wood screw
F	Feather screw
T	Setscrew
Y	"
B	Bolt
N	Nut
W	Washer
R	E-ring
E	–
P	Spring

Shape of head

P		Pan head
S		Flat countersunk head
H		Oval countersunk head
D		Binding head
R		Round head
B		Round head
T		Truss head

Material

Symbol letter	Material
S	Steel
E	Stainless steel
C	Cast iron
U	Bronze
B	Brass
P	Phosphor bronze
N	German silver
Y	Brass
A	Aluminum
Z	Zinc-alloy
K	Polycarbonate

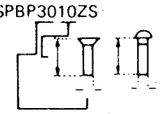
1-1 Type of screw

P	Cross-Recessed head screw
A	Tapping screw
B	Tapping screw
T	Tapping screw
E	Tapping screw

1-2 Diameter and Length of screw

– Example –

SPBP3010ZS



(Diameter x 10)

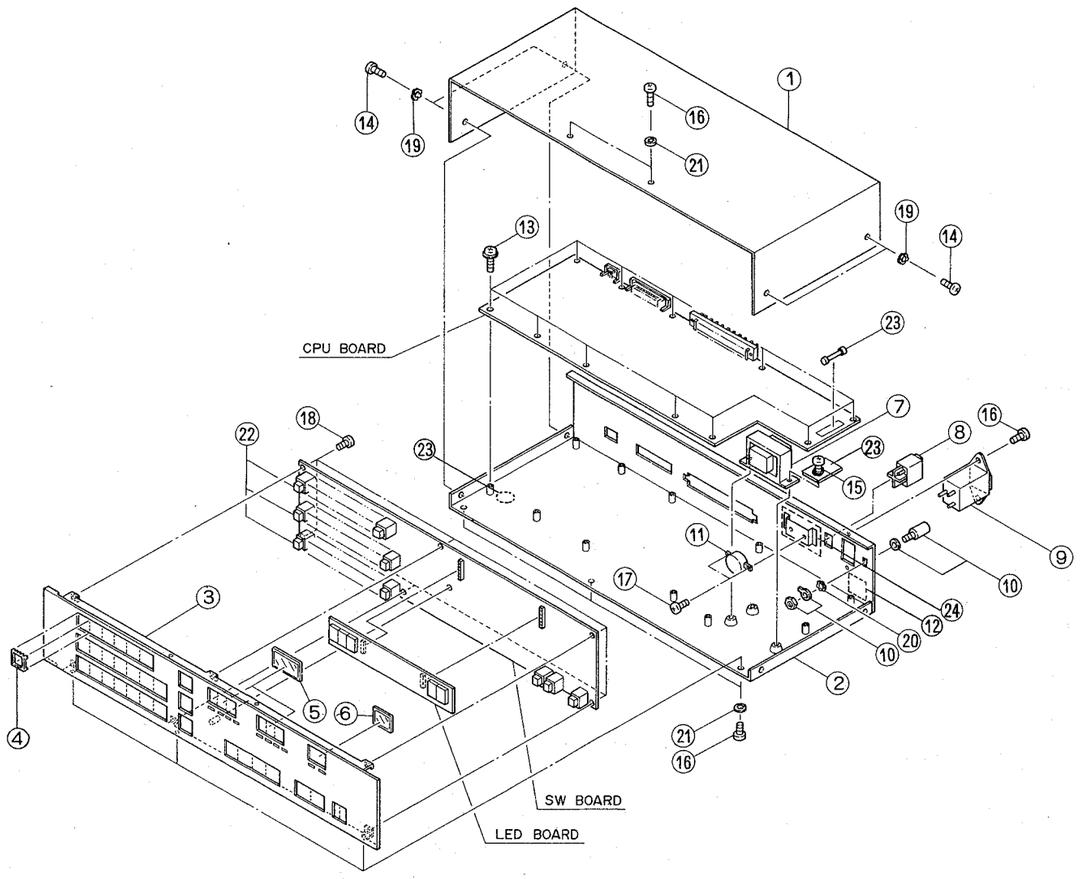
E-ring Washer

REE3000 WNS3000N

Surface treatment

Symbol letter	Surface treatment
Z	Galvanization, dichromic acid treatment (MFZn2-C)
N	Nickel plating (MFNi2, MFNi1)
R	Chrome plating (MBCr2, MBCr1)
G	Silver plating (SP4)
W	Nichrome platings
P	Phosphite treatment
B	Bronze plating
M	Black coloring after galvanization
A	Red coloring after galvanization
C	Blue coloring after galvanization
T	Green coloring after galvanization
V	Violet coloring after galvanization
F	Iron with black coloring

4.2 MI-F30 ASSEMBLY M1



SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

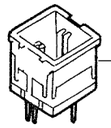
— MI-F30 assembly parts list — M1MM□□□□

Symbol No.	Part No.	Part Name	Description	Q'ty
1	SS33029	Upper Cover		1
2	SS21464-001	Bottom Chassis	U version	1
	" -002	"	EG, EK version	1
3	SS21463-002	Front Panel		1
4	SC40965-002	Switch Escutcheon		1
5	SS44059-003	Escutcheon		1
6	" -004	"		1
⚠ 7	SSV0948	Power Transformer	U version 120 V	1
⚠	SSV0949	"	EG, EK version 220 V/240 V	1
⚠ 8	QSE2100-001	Switch		1
⚠ 9	QMF51U1-R40	Fuse	F1 400 mA U version	1
⚠	QMF51A2-R20	"	F1 T200 mA EG, EK version	1
10	EO3619-001	GND Terminal Ass'y		1
⚠ 11	QSR0074-003-BS	Rotary Switch	EG, EK version only	1
12	—	Name Plate Serial Plate		1
13	DPSP3008N	Screw	M3 x 8	11
14	SDST4008M	"	M4 x 8	4
15	SBST4006Z	"	M4 x 6	2
16	SDST3006M	"	M3 x 6	7
17	SBST3006M	"	M3 x 6 EG, EK version only	2
18	SBST3006Z	"	M3 x 6	7
19	WBS4000N	Washer	M4	4
20	WBS6000	"	M6	1
21	WAS3000M	"	M3	5
22	SCV0292-100	Push Switch Ass'y		8
	" -110	"	These push switch ass'ys are composed of	1
	" -130	"	3 parts.	1
	" -140	"	For detail, refer to the following note.	12
	" -150	"		8
23	S41735	Plate		2
⚠ 24	SC41058-004	Caution Label	U version	1
⚠	SC40341-001	"	EG, EK version	1
	SC40855-001	Earth Label	EK version	1

Note: The following figures and tables show composition of the push switch assembly and the components part numbers.

Color	Part No.	Part Name	Q'ty
White	SCV0326-100	Cap	8
Red	" -110	"	1
Green	" -130	"	1
Orange	" -140	"	12
Yellow	" -150	"	8

	SCV0302-100	Lamp Ass'y	30



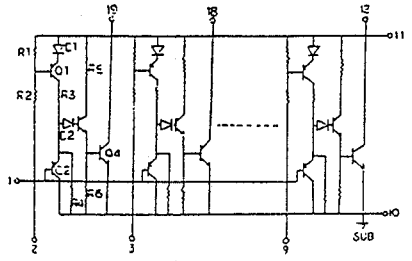
	SCV1439	Push Switch	30

4-2

SECTION 5
CHARTS AND DIAGRAMS

5.1 IC BLOCK DIAGRAMS

BA6212



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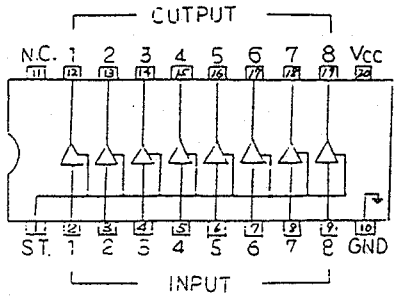

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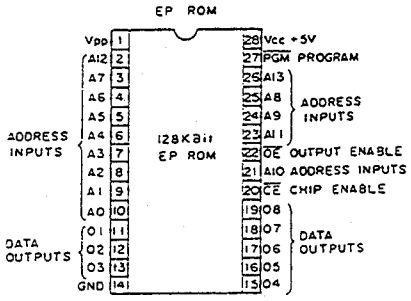

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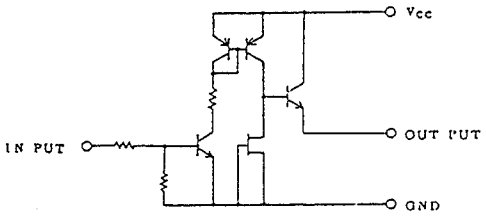

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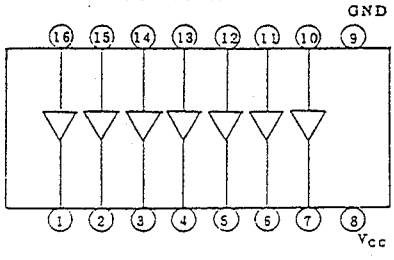

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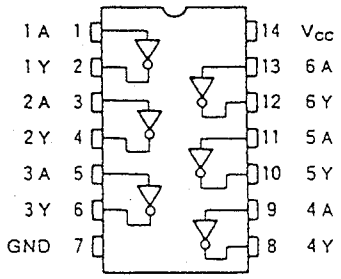

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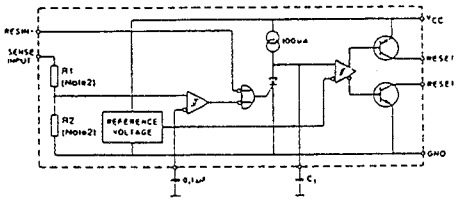

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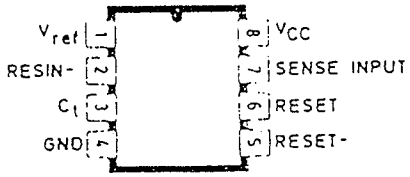

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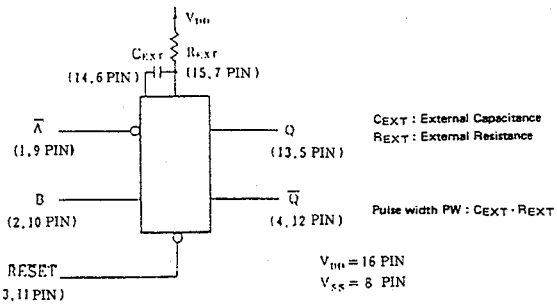

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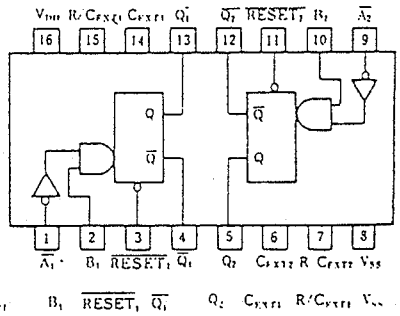

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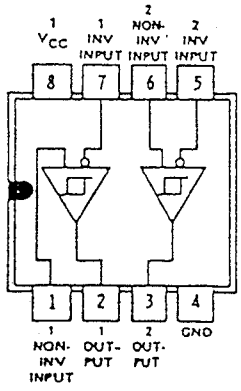

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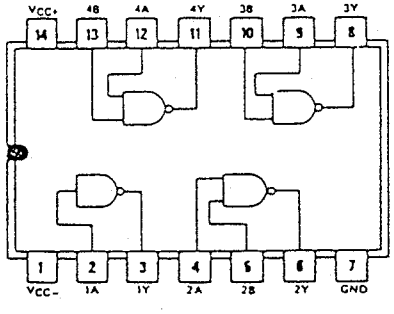

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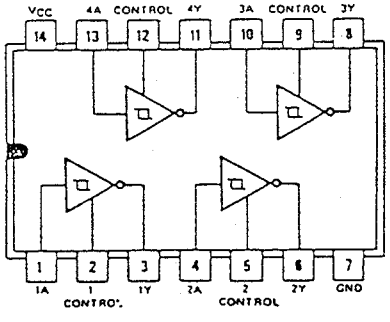

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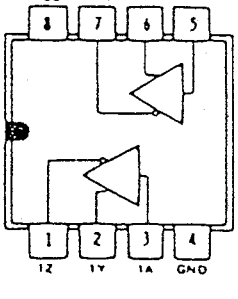

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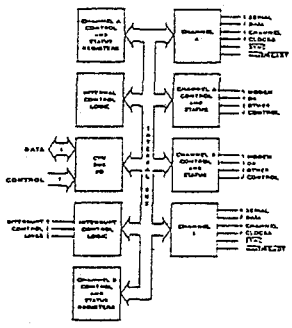
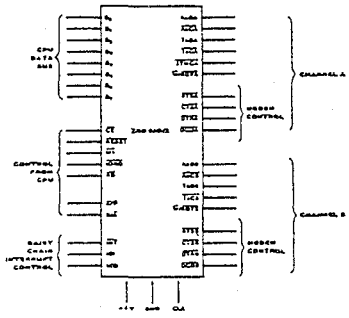
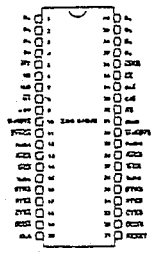




TOP VIEW



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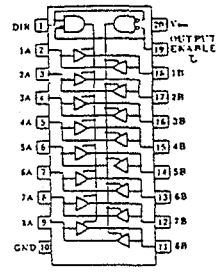

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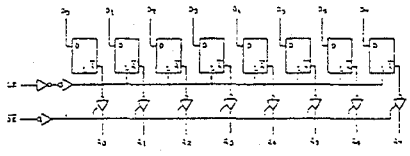

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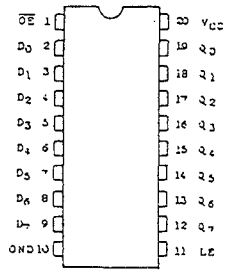

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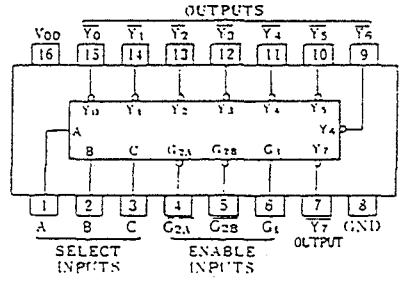

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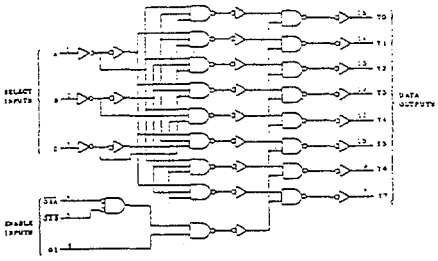

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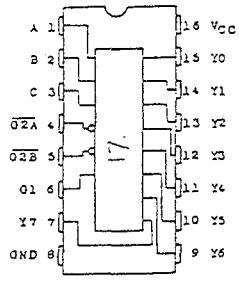

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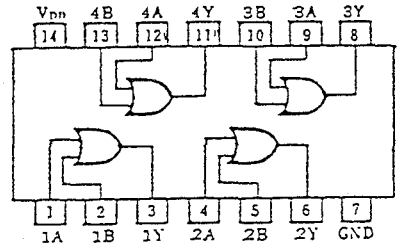

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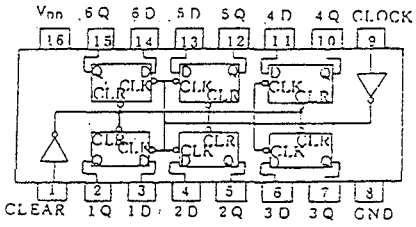

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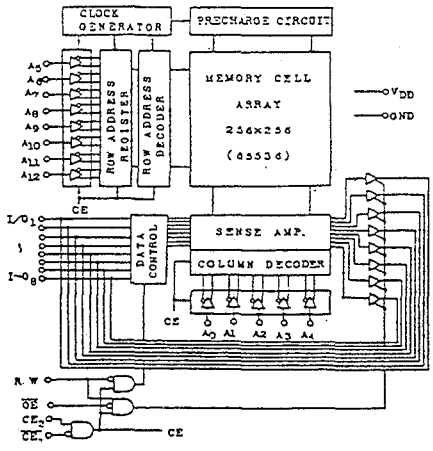
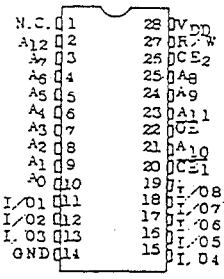


TOP VIEW



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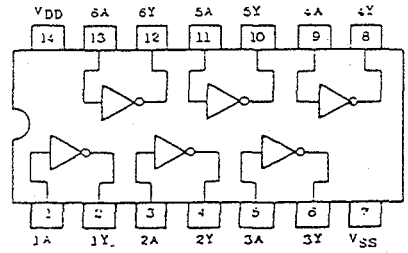

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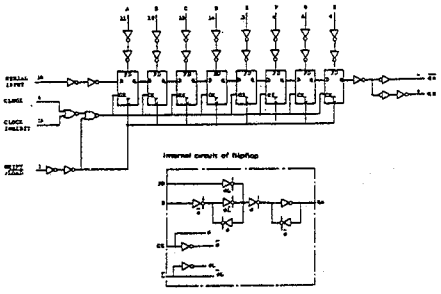
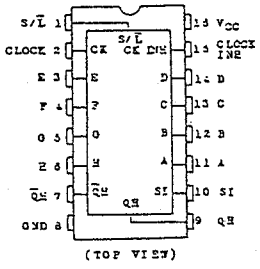


TOP VIEW



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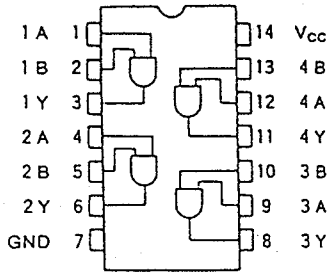

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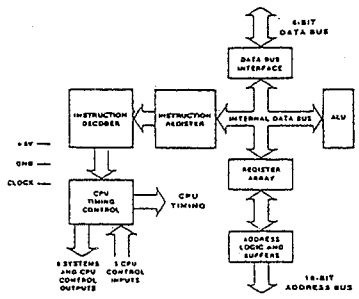

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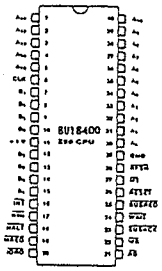

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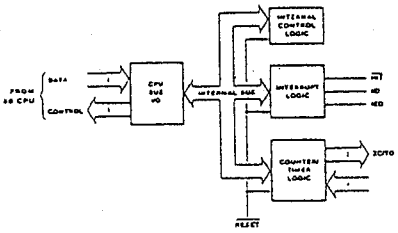

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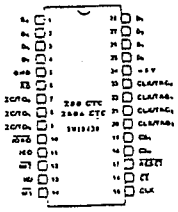

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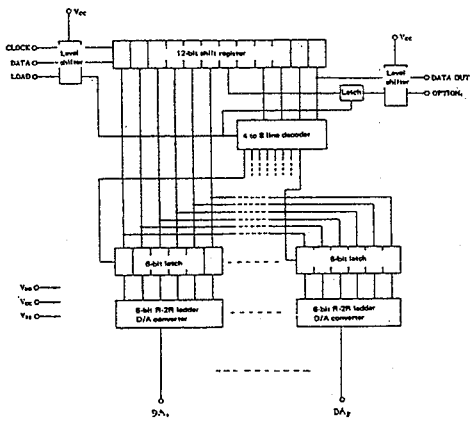

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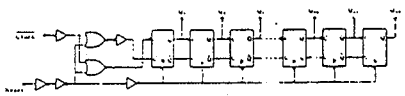

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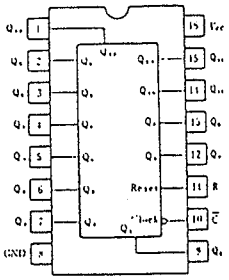

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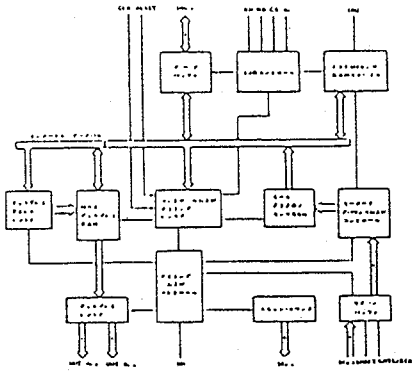

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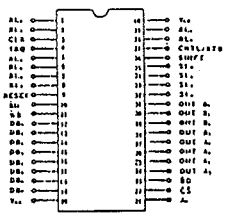
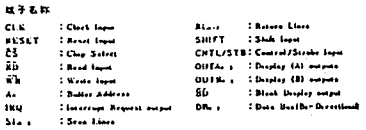
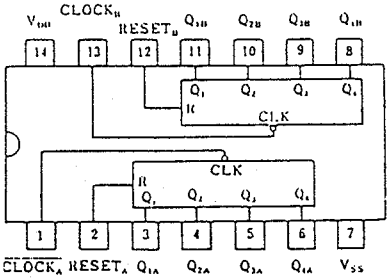
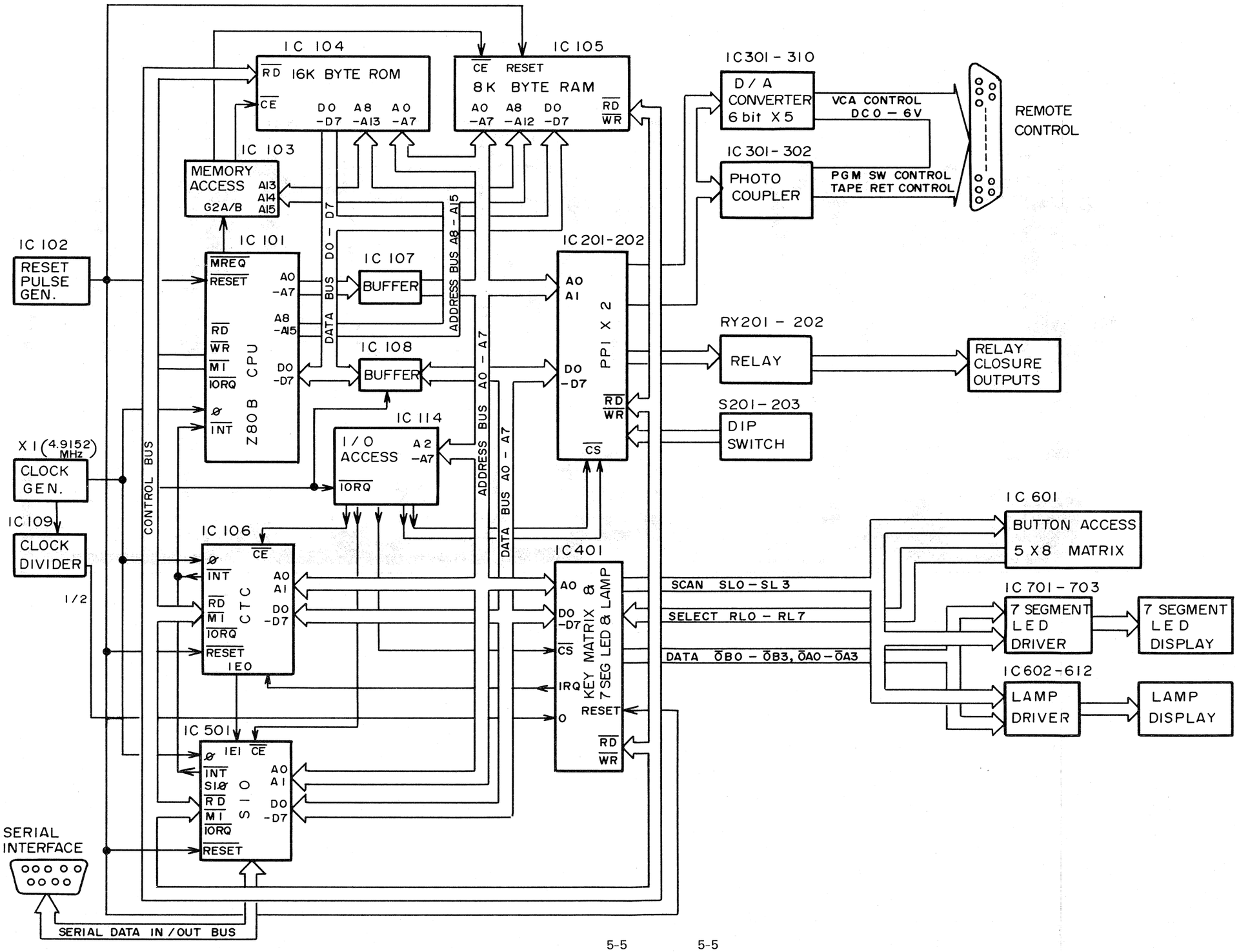




μPD74HC393C

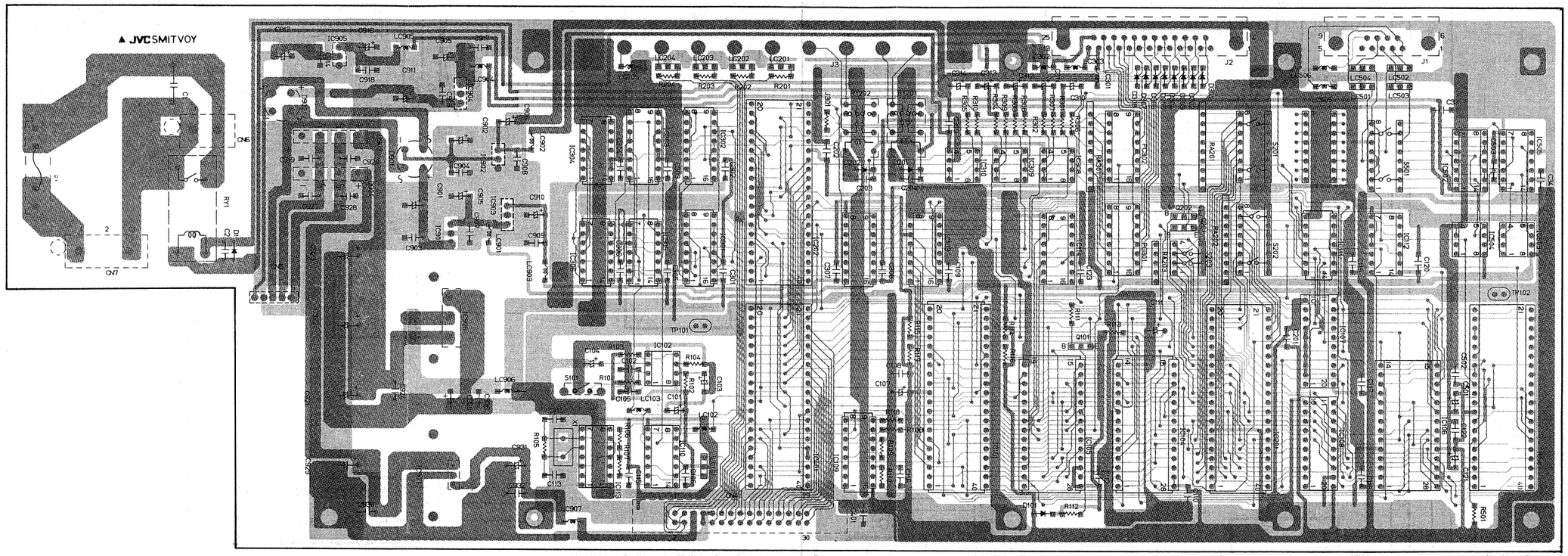


5.2 MI-F30 BLOCK DIAGRAM

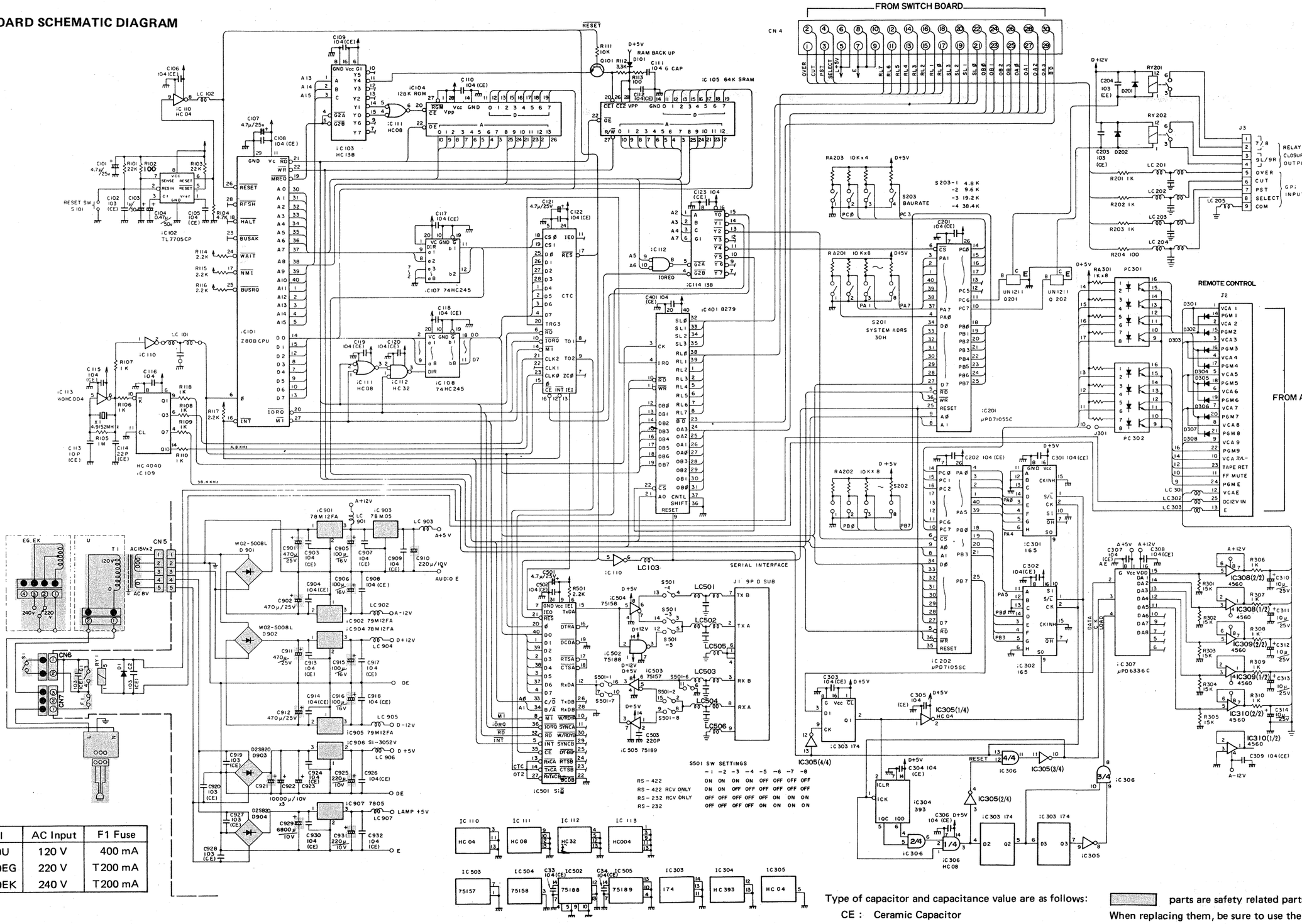


5-5

5.3 CPU CIRCUIT BOARD



5.4 CPU BOARD SCHEMATIC DIAGRAM



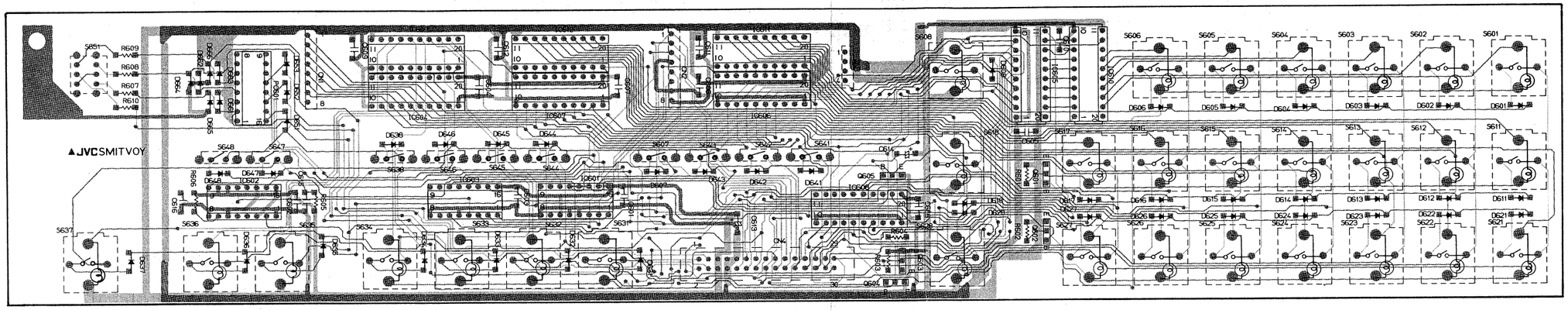
Model	AC Input	F1 Fuse
MI-F30U	120 V	400 mA
MI-F30EG	220 V	T200 mA
MI-F30EK	240 V	T200 mA

Type of capacitor and capacitance value are as follows:

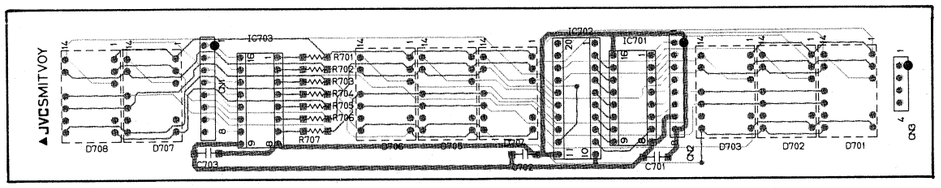
CE : Ceramic Capacitor
103 : 0.01 μF
104 : 0.01 μF

▨ parts are safety related parts.
When replacing them, be sure to use the specified ones.

5.5 SWITCH CIRCUIT BOARD

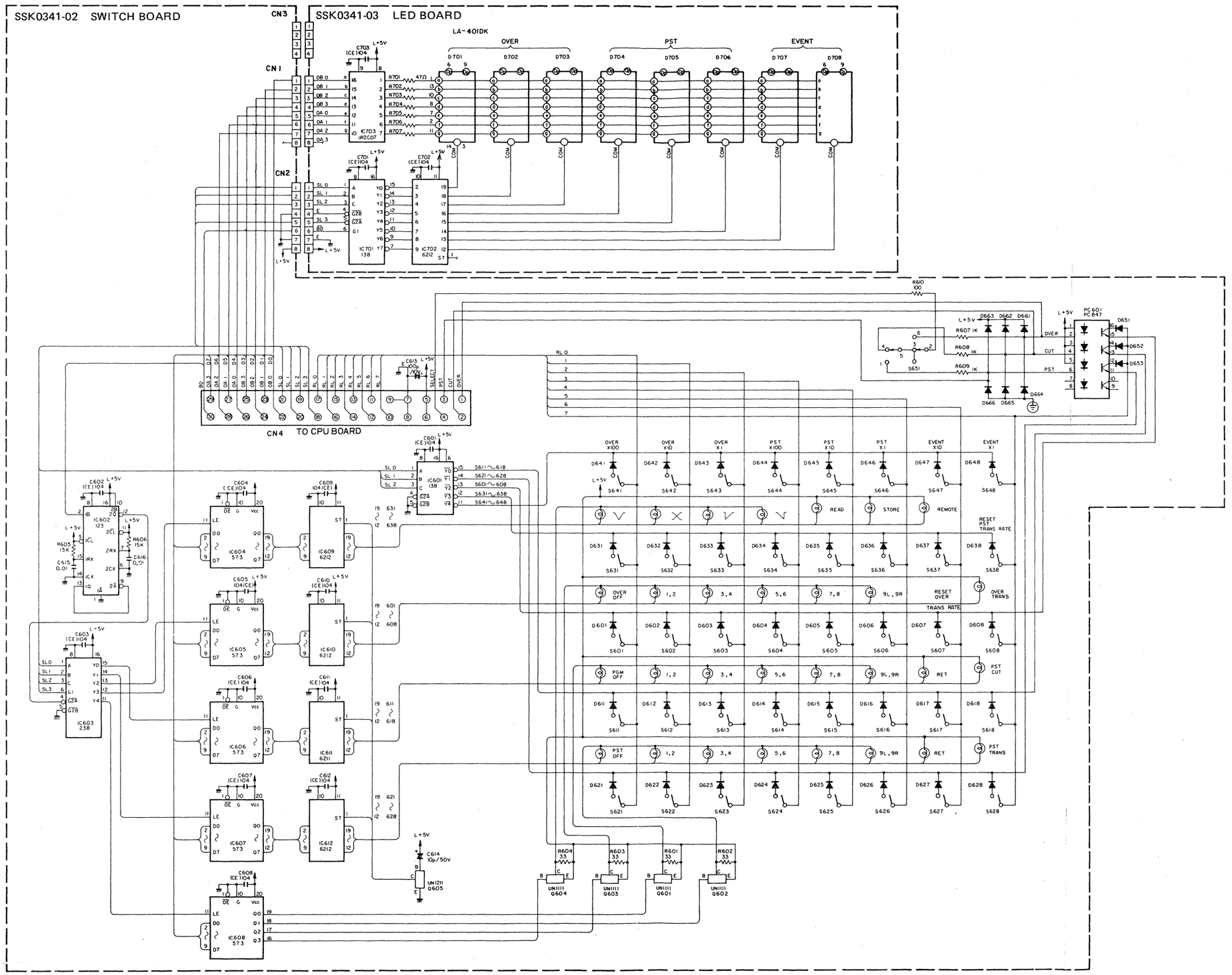


5.6 LED CIRCUIT BOARD



5-8

5.7 SWITCH & LED BOARDS SCHEMATIC DIAGRAM



SECTION 6
ELECTRICAL PARTS LIST

1. **IMPORTANT SAFETY NOTICE**
Parts identified by the ⚠ symbol are critical for safety. Replace with parts number specified. For maximum reliability and performance, all other replacement parts should be identical to those specified.

2. Abbreviations in this list are as follows:
RESISTORS – All resistance values are in ohms (Ω).
K : 1 000
M : 1 000 000
CR : Carbon Resistor
Comp. R: Composition Resistor
WR : Wire Wound Resistor
OMR : Oxide Metal Film Resistor
VR : Variable Resistor (Potentiometer)
MFR : Metal Film Resistor

CAPACITORS – All capacitance values are in μF, unless otherwise indicated.
P : μμF
C Cap : Ceramic Capacitor
E Cap : Electrolytic Capacitor
FM Cap : Film Mica Capacitor
MM Cap : Metalized Mylar Capacitor
MP Cap : Metalized Paper Capacitor
MY Cap : Mylar Capacitor
NP Cap : Non-polar Capacitor
PC Cap : Polycarbonate Capacitor
PP Cap : Poly Pro Capacitor
PS Cap : Polystyrol Capacitor
T Cap : Tantalum Capacitor
TR Cap : Trimmer Capacitor

Tolerances of resistors or capacitors are as follows:
M : ± 20 %
K : ± 10 %
J : ± 5 %
G : ± 2 %
F : ± 1 %

6.1 CPU board assembly

[0][1][ ][ ][ ][ ][ ][ ]

Symbol No.	Part No.	Part Name	Description
IC101	BU18400B	IC	ROHM (Z80B CPU)
IC102	TL7705CP	IC	TEXAS
IC103	LR74HC138	IC	SHARP
IC104	PLSS1043V1-00	EP ROM IC	MBM27128-25CZ
IC105	TC5564APL-15	IC	TOSHIBA
IC106	BU18430B	IC	ROHM Z80B CTC
IC107	LR74HC245	IC	SHARP
IC108	LR74HC245	IC	SHARP
IC109	HD74HC4040P	IC	HITACHI
IC110	TC74HC04P	IC	TOSHIBA
IC111	TC74HC08P	IC	TOSHIBA
IC112	LR74HC32	IC	SHARP
IC113	TC40H004P	IC	TOSHIBA
IC114	LR74HC138	IC	SHARP
IC201	UPD71055C	IC	NEC (PPI)
IC202	UPD71055C	IC	NEC (PPI)
IC301	TC74HC165P	IC	TOSHIBA
IC302	TC74HC165P	IC	TOSHIBA
IC303	LR74HC174	IC	SHARP
IC304	UPD74HC393C	IC	NEC
IC305	TC74HC04P	IC	TOSHIBA
IC306	TC74HC08P	IC	TOSHIBA
IC307	UPD6336C	IC	NEC (D/A)
IC308	NJM4560DD	IC	JRC
IC309	NJM4560DD	IC	JRC
IC310	NJM4560DD	IC	JRC
IC401	UPD8279C-5	IC	NEC
IC501	BU18440B	IC	ROHM (SIO/O)
IC502	SN75188N	IC	TEXAS
IC503	SN75157P	IC	TEXAS
IC504	SN75158P	IC	TEXAS
IC505	SN75189AN	IC	TEXAS
⚠ IC901	NJM78M12FA	IC	JRC
⚠ IC902	NJM79M12FA	IC	JRC
⚠ IC903	NJM78M05FA	IC	JRC
⚠ IC904	NJM78M12FA	IC	JRC
⚠ IC905	NJM79M12FA	IC	JRC
⚠ IC906	SI-3052V	IC	
⚠ IC907	NJM7805FA	IC	JRC
Q101	2SC1570NP(F)	Transistor	SANYO
Q201	UN1211	Transistor	MATSUSHITA
Q202	UN1211	Transistor	MATSUSHITA
D1	MA165	Diode	MATSUSHITA
D101	MA165	Diode	MATSUSHITA
D201	MA165	Diode	MATSUSHITA
D202	MA165	Diode	MATSUSHITA

Symbol No.	Part No.	Part Name	Description
D301	MA165	Diode	MATSUSHITA
D302	MA165	Diode	MATSUSHITA
D303	MA165	Diode	MATSUSHITA
D304	MA165	Diode	MATSUSHITA
D305	MA165	Diode	MATSUSHITA
D306	MA165	Diode	MATSUSHITA
D307	MA165	Diode	MATSUSHITA
D308	MA165	Diode	MATSUSHITA
⚠ D901	W02-5008L	Diode	
⚠ D902	W02-5008L	Diode	
⚠ D903	D2SB20	Diode	
⚠ D904	D2SB20	Diode	
PC301	PC-847	PHOTO COUPLER	
PC302	PC-847	PHOTO COUPLER	
LC101	DSS306-55B101M	EMI Filter	
LC102	SSV0362	F.BEAD	
LC103	SSV0362	F.BEAD	
LC201	DSS306-55B102M	EMI Filter	
LC202	DSS306-55B102M	EMI Filter	
LC203	DSS306-55B102M	EMI Filter	
LC204	DSS306-55B102M	EMI Filter	
LC205	SSV0362	F.BEAD	
LC301	SSV0362	F.BEAD	
LC302	SSV0362	F.BEAD	
LC303	SSV0362	F.BEAD	
LC501	DSS306-55B102M	EMI Filter	
LC502	DSS306-55B102M	EMI Filter	
LC503	DSS306-55B102M	EMI Filter	
LC504	DSS306-55B102M	EMI Filter	
LC505	SSV0362	F.BEAD	
LC506	SSV0362	F.BEAD	
LC901	SSV0362	F.BEAD	
LC902	SSV0362	F.BEAD	
LC903	SSV0362	F.BEAD	
LC904	SSV0362	F.BEAD	
LC905	SSV0362	F.BEAD	
LC906	SSV0362	F.BEAD	
LC907	SSV0362	F.BEAD	
X1	SSV0387	X'tal	4.9152 MHz
⚠ C1	QCZ9019-103-BS	C Cap	0.01 AC 400 V
C2	QCF31HP-103	C Cap	0.01
C33	QCZ0206-104	C Cap	0.1
C34	QCZ0206-104	C Cap	0.1

Symbol No.	Part No.	Part Name	Description
C101	QER61EM-475	E Cap	4.7 25 V
C102	QCF31HP-103	C Cap	0.01
C103	QER61HM-105	E Cap	1.0
C104	QETC1HM-474	E Cap	0.47 50 V
C105	QCZ0206-104	C Cap	0.1
C106	QCZ0206-104	C Cap	0.1
C107	QEJ61AM-475	TT Cap	4.5
C108	QCZ0206-104	C Cap	0.1
C109	QCZ0206-104	C Cap	0.1
C110	QCZ0206-104	C Cap	0.1
C111	SMV2209-104	G. Cap	0.1
C112	QCZ0206-104	C Cap	0.1
C113	QCS31HJ-100	C Cap	10 P
C114	QCS31HJ-220	C Cap	22 P
C115	QCZ0206-104	C Cap	0.1
C116	QCZ0206-104	C Cap	0.1
C117	QCZ0206-104	C Cap	0.1
C118	QCZ0206-104	C Cap	0.1
C119	QCZ0206-104	C Cap	0.1
C120	QCZ0206-104	C Cap	0.1
C121	QEJ61AM-475	C Cap	4.7
C122	QCZ0206-104	C Cap	0.1
C123	QCZ0206-104	C Cap	0.1
C201	QCZ0206-104	C Cap	0.1
C202	QCZ0206-104	C Cap	0.1
C203	QCF31HP-103	C Cap	0.01
C204	QCF31HP-103	C Cap	0.01
C301	QCZ0206-104	C Cap	0.1
C302	QCZ0206-104	C Cap	0.1
C303	QCZ0206-104	C Cap	0.1
C304	QCZ0206-104	C Cap	0.1
C305	QCZ0206-104	C Cap	0.1
C306	QCZ0206-104	C Cap	0.1
C307	QCZ0206-104	C Cap	0.1
C308	QCZ0206-104	C Cap	0.1
C309	QCZ0206-104	C Cap	0.1
C310	QER61CM-106	E Cap	10 16 V
C311	QER61CM-106	E Cap	10 16 V
C312	QER61CM-106	E Cap	10 16 V
C313	QER61CM-106	E Cap	10 16 V
C314	QER61CM-106	E Cap	10 16 V
C401	QCZ0206-104	C Cap	0.1
C501	QEJ61AM-475	TT Cap	4.7
C502	QCZ0206-104	C Cap	0.1
C503	QCS31HJ-221	C Cap	220 P
⚠ C901	QETC1EM-477	E Cap	470 25 V
⚠ C902	QETC1EM-477	E Cap	470 25 V
C903	QCZ0206-104	C Cap	0.1
C904	QCZ0206-104	C Cap	0.1
⚠ C905	QETC1CM-107	E Cap	100 16 V
⚠ C906	QETC1CM-107	E Cap	100 16 V
C907	QCZ0206-104	C Cap	0.1
C908	QCZ0206-104	C Cap	0.1
C909	QCZ0206-104	C Cap	0.1
⚠ C910	QETC1AM-227	E Cap	220 10 V
⚠ C911	QETC1EM-477	E Cap	470 25 V

Symbol No.	Part No.	Part Name	Description	
⚠ C912	QETC1EM-477	E Cap	470	25 V
C913	QCZ0206-104	C Cap	0.1	
C914	QCZ0206-104	C Cap	0.1	
⚠ C915	QETC1CM-107	E Cap	100	16 V
⚠ C916	QETC1CM-107	E Cap	100	16 V
C917	QCZ0206-104	C Cap	0.1	
C918	QCZ0206-104	C Cap	0.1	
C919	QCF31HP-103	C Cap	0.01	
C920	QCF31HP-103	C Cap	0.01	
⚠ C921	QETB1AM-109	E Cap	10000	10 V
C922	QETB1AM-109	E Cap	10000	10 V
C923	QETB1AM-109	E Cap	10000	10 V
C924	QCZ0206-104	C Cap	0.1	
⚠ C925	QETC1AM-227	E Cap	220	10 V
C926	QCZ0206-104	C Cap	0.1	
C927	QCF31HP-103	C Cap	0.01	
C928	QCF31HP-103	C Cap	0.01	
⚠ C929	QETB1AM-478	E Cap	4700	10 V
C930	QCZ0206-104	C Cap	0.1	
⚠ C931	QETC1AM-227	E Cap	220	10 V
C932	QCZ0206-104	C Cap	0.1	
R101	QRD161J-223	CR	22 K	1/6 W
R102	QRD161J-101	CR	100	1/6 W
R103	QRD161J-223	CR	22 K	1/6 W
R104	QRD161J-472	CR	4.7 K	1/6 W
R105	QRD161J-105	CR	1 M	1/6 W
R106	QRD161J-102	CR	1 K	1/6 W
R107	QRD161J-102	CR	1 K	1/6 W
R108	QRD161J-102	CR	1 K	1/6 W
R109	QRD161J-102	CR	1 K	1/6 W
R110	QRD161J-102	CR	1 K	1/6 W
R111	QRD161J-103	CR	100 K	1/6 W
R112	QRD161J-332	CR	3.3 K	1/6 W
R113	QRD161J-101	CR	100	1/6 W
R114	QRD161J-222	CR	2.2 K	1/6 W
R115	QRD161J-222	CR	2.2 K	1/6 W
R116	QRD161J-222	CR	2.2 K	1/6 W
R117	QRD161J-222	CR	2.2 K	1/6 W
R118	QRD161J-102	CR	1 K	1/6 W
R201	QRD161J-102	CR	1 K	1/6 W
R202	QRD161J-102	CR	1 K	1/6 W
R203	QRD161J-102	CR	1 K	1/6 W
R204	QRD161J-101	CR	100	1/6 W
R301	QRD161J-153	CR	15 K	1/6 W
R302	QRD161J-153	CR	15 K	1/6 W
R303	QRD161J-153	CR	15 K	1/6 W
R304	QRD161J-153	CR	15 K	1/6 W
R305	QRD161J-153	CR	15 K	1/6 W
R306	QRD161J-102	CR	1 K	1/6 W
R307	QRD161J-102	CR	1 K	1/6 W
R308	QRD161J-102	CR	1 K	1/6 W
R309	QRD161J-102	CR	1 K	1/6 W
R310	QRD161J-102	CR	1 K	1/6 W
R501	QRD161J-222	CR	2.2 K	1/6 W

Symbol No.	Part No.	Part Name	Description
RA202	QRB081K-103	RESIST. NET WORK	10 K
RA203	QRB041K-103	RESIST. NET WORK	10 K
RA301	QRB081K-102	RESIST. NET WORK	1 K
⚠ RY1	SSV0861	POWER RELAY	
RY201	G5A237-DC12	RELAY	
RY202	G5A237-DC12	RELAY	
S101	SSV0954	P. Switch	RESET
S201	SCV1131-001	DIP Switch	SYSTEM ADRS
S202	SCV1131-001	DIP Switch	MODE
S203	SCV0953-040	DIP Switch	BAUD RATE
S501	SCV1131-001	DIP Switch	SERIAL INTER-FACE MODE
F1	SCV1271-001	Fuse Clip	
F1	SCV1271-002	Fuse Clip	
J1	SSV1002-S09	Connector	9-pin
J2	SSV1002-S25	Connector	25-pin
J3	SSV0956-009	Terminal	9-pin
CN4	SS31002-030	Connector	30-pin
CN5	SS30644-005	Connector	5-pin
⚠ CN6	SS30810-002	Connector	2-pin
⚠ CN7	SS30810-003	Connector	3-pin
	SMV2152	HEAT SINK	Screw DPSP3008Z x 2

6.2 SWITCH board assembly

Symbol No.	Part No.	Part Name	Description
IC601	LR74HC138	IC	SHARP
IC602	UPD74HC123AC	IC	NEC
IC603	TC74H238P	IC	TOSHIBA
IC604	TC74H573P	IC	TOSHIBA
IC605	TC74H573P	IC	TOSHIBA
IC606	TC74H573P	IC	TOSHIBA
IC607	TC74H573P	IC	TOSHIBA
IC608	TC74H573P	IC	TOSHIBA
IC609	BA6212	IC	ROHM
IC610	BA6212	IC	ROHM
IC611	BA6212	IC	ROHM
IC612	BA6212	IC	ROHM
PC601	PC-847	PHOTO COUPLER	
Q601	UN1111	Transistor	MATSUSHITA
Q602	UN1111	Transistor	MATSUSHITA
Q603	UN1111	Transistor	MATSUSHITA
Q604	UN1111	Transistor	MATSUSHITA
Q605	UN1211	Transistor	MATSUSHITA
D601	MA165	Diode	MATSUSHITA
D602	MA165	Diode	MATSUSHITA
D603	MA165	Diode	MATSUSHITA
D604	MA165	Diode	MATSUSHITA
D605	MA165	Diode	MATSUSHITA
D606	MA165	Diode	MATSUSHITA
D607	MA165	Diode	MATSUSHITA
D608	MA165	Diode	MATSUSHITA
D611	MA165	Diode	MATSUSHITA
D612	MA165	Diode	MATSUSHITA
D613	MA165	Diode	MATSUSHITA
D614	MA165	Diode	MATSUSHITA
D615	MA165	Diode	MATSUSHITA
D616	MA165	Diode	MATSUSHITA
D617	MA165	Diode	MATSUSHITA
D618	MA165	Diode	MATSUSHITA
D621	MA165	Diode	MATSUSHITA
D622	MA165	Diode	MATSUSHITA
D623	MA165	Diode	MATSUSHITA
D624	MA165	Diode	MATSUSHITA
D625	MA165	Diode	MATSUSHITA
D626	MA165	Diode	MATSUSHITA
D627	MA165	Diode	MATSUSHITA
D628	MA165	Diode	MATSUSHITA
D631	MA165	Diode	MATSUSHITA
D632	MA165	Diode	MATSUSHITA
D633	MA165	Diode	MATSUSHITA
D634	MA165	Diode	MATSUSHITA
D635	MA165	Diode	MATSUSHITA
D636	MA165	Diode	MATSUSHITA

Symbol No.	Part No.	Part Name	Description	
D637	MA165	Diode	MATSUSHITA	
D638	MA165	Diode	MATSUSHITA	
D641	MA165	Diode	MATSUSHITA	
D642	MA165	Diode	MATSUSHITA	
D643	MA165	Diode	MATSUSHITA	
D644	MA165	Diode	MATSUSHITA	
D645	MA165	Diode	MATSUSHITA	
D646	MA165	Diode	MATSUSHITA	
D647	MA165	Diode	MATSUSHITA	
D648	MA165	Diode	MATSUSHITA	
D651	MA165	Diode	MATSUSHITA	
D652	MA165	Diode	MATSUSHITA	
D653	MA165	Diode	MATSUSHITA	
D661	MA165	Diode	MATSUSHITA	
D662	MA165	Diode	MATSUSHITA	
D663	MA165	Diode	MATSUSHITA	
D664	MA165	Diode	MATSUSHITA	
D665	MA165	Diode	MATSUSHITA	
D666	MA165	Diode	MATSUSHITA	
R601	QRD161J-330	CR	33	1/6 W
R602	QRD161J-330	CR	33	1/6 W
R603	QRD161J-330	CR	33	1/6 W
R604	QRD161J-330	CR	33	1/6 W
R605	QRD161J-153	CR	15 K	1/6 W
R606	QRD161J-153	CR	15 K	1/6 W
R607	QRD161J-102	CR	1 K	1/6 W
R608	QRD161J-102	CR	1 K	1/6 W
R609	QRD161J-102	CR	1 K	1/6 W
R610	QRD161J-101	CR	100	1/6 W
C601	QCZ0206-104	C Cap	0.1	
C602	QCZ0206-104	C Cap	0.1	
C603	QCZ0206-104	C Cap	0.1	
C604	QCZ0206-104	C Cap	0.1	
C605	QCZ0206-104	C Cap	0.1	
C606	QCZ0206-104	C Cap	0.1	
C607	QCZ0206-104	C Cap	0.1	
C608	QCZ0206-104	C Cap	0.1	
C609	QCZ0206-104	C Cap	0.1	
C610	QCZ0206-104	C Cap	0.1	
C611	QCZ0206-104	C Cap	0.1	
C612	QCZ0206-104	C Cap	0.1	
C613	QER60JM-107	E Cap	100	
C614	QER61JM-106	E Cap	10	16 V
C615	QFN31HJ-103	MY Cap	0.01	50 V
C616	QFN31HJ-103	MY Cap	0.01	50 V
CN1	SCV0495-008	Connector	8-pin	
CN2	SCV0495-008	Connector	8-pin	
CN3	SCV0495-004	Connector	4-pin	
CN4	SC42462-030	Connector	30-pin	

Symbol No.	Part No.	Part Name	Description
S607	SSV0954	P. Switch	OVER TRANS. RESET
S638	SSV0954	P. Switch	PST TRANS. RESET
S641	SSV0954	P. Switch	OVER TRANS. SET
S642	SSV0954	P. Switch	OVER TRANS. SET
S643	SSV0954	P. Switch	OVER TRANS. SET
S644	SSV0954	P. Switch	PST TRANS. SET
S645	SSV0954	P. Switch	PST TRANS. SET
S646	SSV0954	P. Switch	PST TRANS. SET
S647	SSV0954	P. Switch	EVENT SET
S648	SSV0954	P. Switch	EVENT SET
S651	SSV0957	Toggle Switch	GPI SELECT
S601~606 S607~637	Refer to "Exploded View and Parts List" in this manual.		

6.3 LED board assembly

03

Symbol No.	Part No.	Part Name	Description	
IC701	LR74HC138	IC	SHARP	
IC702	BA6212	IC	ROHM	
IC703	IR2C07	IC	SHARP	
D701	LA-401DK	7 SEG		
D702	LA-401DK	7 SEG		
D703	LA-401DK	7 SEG		
D704	LA-401DK	7 SEG		
D705	LA-401DK	7 SEG		
D706	LA-401DK	7 SEG		
D707	LA-401DK	7 SEG		
D708	LA-401DK	7 SEG		
C701	QCZ0206-104	C Cap	0.1	
C702	QCZ0206-104	C Cap	0.1	
C703	QCZ0206-104	C Cap	0.1	
R701	QRD161J-470	CR	47	1/6 W
R702	QRD161J-470	CR	47	1/6 W
R703	QRD161J-470	CR	47	1/6 W
R704	QRD161J-470	CR	47	1/6 W
R705	QRD161J-470	CR	47	1/6 W
R706	QRD161J-470	CR	47	1/6 W
R707	QRD161J-470	CR	47	1/6 W
CN1	SCV0495-008	Connector	8-pin	
CN2	SCV0495-008	Connector	8-pin	
CN3	SCV0495-008	Connector	8-pin	